

The Kinetics of the Adsorption of Zinc in Sanitary Leachate Using Mango Seeds (*Mangifera Indica*) as Synthetic Activated Carbon for Treatment

Ray Francis G. Ralota *

Graduate School, Department of Environmental and Sanitary Engineering, College Engineering, National University, Manila

Engr. Raul B. Borlungay

Academic Adviser, National University, Manila

Dr. Eugenia L. Lagmay

Panel Chair, National University, Manila

Engr. Gerardo Abestilla

Panel Member, National University, Manila

Engr. Godofredo Mendoza

Panel Member, National University, Manila

Dr. Krister Ian Daniel Z. Roquel

Dean, College of Engineering, National University, Manila

Abstract

Mangoes are one of the most popular products in Cebu City, used in food, cosmetics, and occasionally in the furniture-making industry, which increases their demand each year. This study aims to find an alternative solution to its rising waste problems by turning its seed part into another form of product to treat zinc, which is one of the prevailing minerals that is present in the sanitary leachate because of its electronic waste composition. These mango seed wastes were processed into activated carbon through physical activation, placing it in the furnace at a temperature of 800°C with a controlled oxygen environment, and were tested for the adsorption process by placing the produced synthetic activated carbon on top of the filter paper placed in the funnel. Then, a liquid containing the synthetic zinc with a concentration of 0.13 ppm was poured into the funnel. It showed that after 24 hours in the rotary shaker, the zinc concentration was significantly reduced to an average of 92.83%, revealing that the mango seed is an outstanding material for activated carbon. Mango seed wastes from industries have great potential as a source of activated carbon in influencing the treatment of sanitary leachates with a higher concentration of zinc.

